Residue and Use-wear Analysis of Lithic Unifaces from the Hickory Bluff Site (7K-C-411), Dover, Delaware

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PARSONS REVIEW COMMENTS
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Draft Report, "Residue and Use-Wear Analysis of Lithic Unifaces from the Hickory Bluff Site (7K-C-411), Dover, Delaware" by Bruce L. Hardy

General:

Overall, this approach to lithic residue/use-wear is excellent and will provide useful information on tool use and function. Your report is a very important one for interpretation at the Hickory Bluff site, but also for Mid-Atlantic archaeology, as we are not familiar with many results like the ones you provided. However, in order to make this a stronger report, several additional pieces of information are needed please.

Introduction:

1) Please cite the relevant literature on uniface studies.

2) Testing of five sediment samples mentioned, but results never provided in this report.

Methods:

3) Citations should be provided after the statement "compared with experimental and published material for identification."

4) Citations should also accompany the statement about organic materials. Isn't this highly controversial in the literature? May want to provide some peer-reviewed articles as back up to your study here.

5) There is reference to line drawings and photographs of artifacts, but only 4 are provided. Can we get more examples that demonstrate your major points?

Results:

Residue:

6) There is reference to new hide-working experiments. This seems to be part of methods. Also, can we get more information on this and why you did it? Seems to be an important verification study?

7) Of the 13 tools that have residue, can you tell us anything more, such as where residues occur on tools. Eg, are they random or on any particular edge?

Use-wear:

8) Please identify the striation patterns that are indicative of boring activities.

9) Please identify the striation patterns that are indicative of cutting or slicing activities.

10) Can you provide any other information on patterns of wear on the 33 tools?

Discussion:

11) It would be good to see some basic comparison analysis, such as % that have single, double, and triple identifications of residue/use/hafting. [In our 1996 *Amer. Antiq.* article, v. 61, 127-135, we found it very useful to correlate different variables and examine preservation/issues].

12) The last paragraph discusses handling as a major factor and problem—in what residues? Handling and washing may be a contributing factor but not primary. Perhaps other influences, such as the intensity of use, raw materials, etc, influence the degree of preservation.

Table 1:

13) Please provide more detailed information on the number (if possible), type, and direction of the striations observed for each tool. Did striations consistently occur along or across the tool edge? Or did the striations occur in discontiguous areas? What kind of striations were observed; were they always perpendicular or oblique striations on scraping tools? Or were other striations also present (e.g. the complex striations in Figure 3)?

14) For our files, we require copies of all photographs for all tools and a drawing/sketch of the tool with the photographed edges marked.

References Cited:

15) A References Cited section needs to accompany this report.

Introduction

Microscopic use-wear and residue analyses were performed on a sample of 50 unifacially retouched lithic artifacts from the Hickory Bluff Site (7K-C-411), Dover, Delaware. All artifacts were minimally handled prior to analysis with the majority being unwashed. A subset of the sample were washed prior to analysis and used in displays in a public outreach program. Five sediment sample were also examined to look for potential residues that were not use-related.

Methods

Each artifact was examined using reflected light microscopy at magnifications ranging from 100 to 500 diameters using an Olympus BX-60 microscope for the presence of residues or wear related to use. Line drawings were made of each artifact and the location of any wear and residues recorded on the drawing. All residues and wear patterns were photographed and compared with experimental and published material for identification. Potentially recognizable residues using this technique include animal (hair, feather, skin, bone, antler, and blood) and plant (starch grains, cellular tissue, wood fragments, and phytoliths) material. Use-wear identification concentrated on striations, polish, and edge rounding to help identify the area of an artifact which was used and the use-action. Use-wear was not used to identify specific use-materials beyond the level of hard/high silica vs. soft material. Sediment samples were examined for the presence of residues which were not use-related. If residues found in the sediment samples as well as on artifacts, the residues on the artifacts were considered to be possible contaminants not related to tool use.

Results

Forty-one of 50 artifacts (82%) showed some type of functional evidence (see Table 1).

Residues

The residues observed on Hickory Bluff artifacts included plant fragments (woody and non-woody tissue), bone or antler particles, and fragments of skin tissue. Residues were identified by comparison to published or experimental material. In the case of the identification of skin tissue, new hide-working experiments were undertaken to obtain more comparative material. Skin tissue observed on artifacts used to scrape dry hide closely matched the morphology of putative skin tissue residues on Hickory Bluff artifacts (Figure 1, 2, 3). Thirteen out of fifty artifacts (26%) exhibited residues, including 7/50 (14%) with skin tissue, 2/50 (4%) with bone or antler particles, and 4/50 (8%) with plant remains. The plant residues included one artifact with starch grains (Figure 4), one artifact with woody plant tissue, and two artifacts with plant tissue for which more specific identification was not possible. One further artifact had shiny black patches on its surface that may be the remains of a mastic. Chemical tests would be necessary in order to confirm this hypothesis.

Use-wear

Thirty-three (66%) of the artifacts exhibited striations and polishes related to use. The positioning and orientation of wear patterns suggests that the most common use-action is scraping (32/50 artifacts or 64%). A scraping use-action is typically indicated by the presence of striations that are perpendicular or oblique to the working edge of the tool. One artifact showed wear patterns suggesting that it was used as a borer and two were used for slicing or cutting.

Hafting

Twenty-four of fifty artifacts (48%) demonstrated some evidence of hafting. Hafting traces included striations or polish confined to the proximal 1/3 to 1/2 of the artifact. On 2 artifacts, plant tissue was also found confined to the proximal portion and may be the remains of the haft itself. Only one artifact exhibited possible mastic.

Discussion

The majority of the unifaces from Hickory Bluff were used as hafted scrapers. The materials scraped included dry hide, bone or antler, and starchy or woody plants. No hair fragments were found on the artifacts interpreted as hide-scrapers making more specific identification (e.g. species) difficult. The presence of starch grains along the working edge on one artifact suggests the processing of a starchy storage organ such as a root or a tuber (Figure 4). At present, more specific identification has not been possible.

Of the fifty artifacts examined, only 13 exhibited residues while 33 had evidence of use-wear. The discrepancy in frequency of the different types of functional information may be related to issue of artifact handling or preservation. A number of the artifacts were washed for public display prior to analysis. This is a likely contributing factor to the relatively low number of artifacts with residues and underscores the value of applying multiple analytical techniques.

Table 1: Hickory Bluff Residue and Use-wear Analysis Summary

Cat. #	Residues	Use-wear	Haft	Use-Action	Comments
114-5	plant tissue	striations/polish distal	yes	complex scraping	scraping plant, hafted
132-3	skin fragments	striations/polish, edge rounding distal	no (prox-imal snap)	scraping	scraping hide, unhafted (but proximal snap)
586-1	none	none	no	unknown	unknown/unused
592-6	skin fragments	polish distal	yes	scraping	scraping hide, hafted
602-1	skin fragments	striations distal	yes	scraping	scraping hide, hafted
675-4	none	striations/polish distal	yes	complex scraping	scraping unknown material, hafted
676-11	plant tissue related to haft	striations distal	yes	complex scraping	scraping unknown material, hafted
742-2	none	edge rounding/striations	no		scraping hard material, unhafted
764-6	none	striations distal, dorsal edge	yes	scraping	scraping unknown material, dorsal surface in contact, hafted
783-7	none	polish and edge rounding	no	scraping	scraping hard material
964-1	skin fragments	striations/edge rounding	yes	scraping	scraping hide, hafted
1002-1	wood fragment	polish/striations distal	yes	scraping	scraping hard material, wood related to haft
1116-2	none	none	no	unknown	unknown/unused
1141-7	bone/antler particles	striations distal	yes	boring?	tip used in boring hard material (bone/antler)

1161-1	skin fragments	polish/striations	no	scraping/ slicing	scraping/slicing hide, unhafted
1169-1	bone/antler particles	striations distal	yes	complex scraping	scraping bone/antler, hafted
1187-3	none	polish/striations distal	yes	scraping	scraping unknown material, hafted
1243-1	none	polish/striations back from distal edge	yes	scraping?	scraping unknown material, possibly recently resharpened, hafted
1287-1	none	striations/polish in one area	no	scraping	scraping unknown material, unhafted
1312-1	none	none	no	unknown	unknown/unused (quartz)
1355-1	none	polish/striations distal	yes	scraping	scraping hard material, hafted
1441-3	none	polish/striations distal	yes	scraping	scraping unknown material, hafted
1621-3	none	polish/striations distal, dorsal and ventral	yes	scraping	scraping unknown material, dorsal and ventral in contact, hafted
1686-1	none	polish/striations distal	yes, dorsal only	scraping	scraping unknown material. juxtaposition haft
1754-4	none	polish/striations distal	yes	scraping	scraping unknown material, hafted
2233-2	none	striations dorsal and ventral	no	scraping	scraping hard/high silica material, dorsal and ventral in contact
2290-2	possible mastic	polish/striations distal	yes?	scraping	scraping unknown material, possible mastic related to haft
2307-1	none	minimal polish	no	unknown	unknown/unused

2568-2	none	none	no	unknown	unknown/unused
2645-4	skin fragment	none	no	unknown	unknown use
2722-4	none	light polish/striations distal	no	scraping	scraping unknown material, little evidence of use
2725-1	starch grains	striations	no	scraping	scraping starchy plant material, starch associated with striations, unhafted
2872-2	none	polish/striations distal	yes, dorsal only	scraping	scraping hard/high silica material, juxtaposition haft
2923-1	none	uniform polish on ventral surface	no	unknown	unknown/unused
3020-2	none	minimal polish	yes	unknown	recently resharpened or unused, hafted
3237-6	skin or bone fragments	polish/striations , edge damage distal	yes	scraping	scraping hide or bone, hafted
3260-3	none	striations proximal	no	unknown	unknown
3372-1	none	polish distal	yes	scraping	scraping unknown material, hafted
3495-4	none	light polish dorsal	no	unknown	unknown, unhafted
3728-5	plant fiber	polish/striations distal, dorsal and ventral	yes	scraping	scraping plant, dorsal and ventral in contact, hafted
3760-3	none	polish/striations distal	**yes**	**scraping**	**scraping unknown material**
3760-4	**none**	**polish/striations distal**	**yes**	**slicing**	**slicing unknown material, hafted**
3999-8	**none**	**polish/striations**	**yes?**	**unknown**	**striations related to haft**

		proximal			or use
4002-2	none	polish/striations distal and proximal	yes?	scraping	scraping unknown material, possibly both ends used at different times
4002-3	none	none	no	unknown	unknown/unused
4062-5	none	polish/striations distal	yes	scraping	scraping unknown material, hafted
4181-1	none	polish distal	no	scraping	scraping unknown material, unhafted
4225-1	none	polish on tip, no striations	no	slicing	slicing soft material, unhafted
4475-2 /4478-5	none	none	no	unknown	unknown/unused, snapped during manufacture?
4476-3	none	polish/striations distal	no	scraping	scraping hard material, unhafted

scraping- ventral surface of retouched edge in contact with use-material unless otherwise noted